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## ALL ABOUT WATER.

*Water: Its Origin and Use.* By William Coles-Finch. Pp. xxi+483; with illustrations. (London: Alston Rivers, Ltd., 1908.) Price 21s. net.

THERE is little about water on which Mr. Coles-Finch does not touch in this volume, for he even takes his readers back to the day when the world was but a glowing mist and oxygen would not have combined with hydrogen. The method has its disadvantages, though useful to anyone in want of an encyclopædic treatise, because the author has often to fall back on second-hand information, not even excluding the "science notes" of a daily journal. His manner of reference also is slipshod, for he is generally content with simply naming the author. But readers are not always trustful, and like to be enabled to consult the original passage—especially after coming across one or two rather puzzling misprints, such as Gretroz for Giétroz, Maindetta for Maladetta, Demavena for Demavend, Dun, perhaps for Dust, and Brunz (the name of a Swiss Lake), we presume for Brienz. Small inaccuracies—such notes as might so easily have been removed by inducing a friend more familiar with the scientific side of the subject to read the proof sheets—are rather too numerous. Here are a few samples. The difference between hard and soft water is said on p. 127 to consist in the relative quantities of carbonate of lime in it, yet just below come the words, "there are two kinds of hardness, permanent and temporary," the one due to the presence of calcium sulphate, the other to its carbonate. The amount of chalk in the world is probably over-estimated by forgetting that it means one, not every kind of limestone. Ice-fields are said, on p. 195, to form every winter on polar seas, but the author directly afterwards speaks of them as occurring on Iceland, and makes an extraordinary statement about those of Greenland. "The ice-fields of Greenland are beyond our comprehension; how high the plateau rises we cannot say. . . . No man has yet penetrated more than 130 miles from the west coast, where the ice is nearer the sea. It is related that explorers, after travelling 130 miles, saw a solid wall of ice 6000 feet high, and rising towards the east" (p. 195). Has he forgotten Nansen and the "First Crossing of Greenland," not to mention later explorations?

The statement about the "parallel roads" in Glenroy is confused. Also, the author is hardly justified in taking it for granted that the erratics near Wolverhampton mark the terminal moraine of a glacier, or that the Scandinavian ice-sheet successfully crossed the deep channel bordering the Norway coast, to deposit boulders at Cromer, and, as he might have added, at least as far inland as Bedford. The Lofoden Islands are hardly "a typical instance of the manner in which the sea has swallowed up the solid land" (p. 330), unless this is by submergence, which he clearly does not mean. They afford no parallel with Reculver Church. "The Lake of Campania in Italy" near Baiæ is

usually called *Avernus* or Averno, and "Lake Chala on Mount Kilimanjaro" does not lie 400 to 800 feet below the summit, for, according to Meyer, Lake Jala, discovered by New, is "at the foot of Kilimanjaro on its south-eastern side." The Lago d'Alleghe in the Italian Tyrol was not formed by the terminal moraine of a vanished glacier, but by a berg fall in 1772. The height of the Lake of Geneva above sea-level is understated by about 70 feet. The maximum depths of the Lake of Constance and of the Lago Maggiore are incorrectly given. The Dead Sea can hardly be said to be "deeply embedded in lofty cliffs of limestone," and we have no reason to suppose that volcanic activity had much to do with forming the Lake of Tiberias. There is no eruption of Vesuvius on record until A.D. 79; it was an earthquake which damaged Pompeii in A.D. 63. The hippopotamus neither has a horn nor had one in the days of Palæolithic man (p. 240).

But, apart from these slips, and notwithstanding some defects of arrangement and a little too much sermonising, Mr. Coles-Finch's book contains a large amount of interesting information. We are told among the *obiter dicta* that Manchester soot comprises 50 per cent. of substances which are not carbon. Among these are "snow-white samples of ammonium chloride, ammonium sulphate, calcium sulphate, and a beautifully crystallised paraffin hydrocarbon." In fact, the heavy hydrocarbon oils in household soot amounted to 13 per cent., and Prof. E. Knecht, who analysed the material, manufactured from these components "a dye stuff which was capable of producing absolutely fast shades of brown on cotton"! We heartily sympathise with the author in his denunciation of the domestic fireplace, so much beloved in this country, for it often contributes about one-half the soot which fouls the atmosphere of London, and produces the minimum of effect at the maximum of cost. We would also gladly commit to his mercies the hooligans who wreck trees planted to adorn towns, and wilful wasters of water such as those who leave a tap running while they are away for a holiday in order to secure that their drains are scoured.

Perhaps the most valuable part of the volume is that dealing with practical matters, where Mr. Coles-Finch speaks from experience, such, for instance, as his description of a water-bearing fissure in the chalk, discovered at a depth of 120 feet while making a well at Strood for the supply of Rochester. Such fissures are, of course, well known as important sources of water supply in the Thames basin, but we do not remember to have seen in any book generally accessible plans, sections and illustrations of them.

The volume is abundantly illustrated by reproduced photographs, the majority of which have been taken in the High Alps and other mountain districts by Mrs. Aubrey Le Blond. Some of these, perhaps, are not very closely connected with the text, and Mr. Coles-Finch has too often failed to indicate by a reference the subject which a picture is meant to illustrate; but they are often so pretty as to add materially to the attractiveness of the volume; though in some, as will

happen in Alpine scenery, the rocks have come out too dark. Among the full-page illustrations, hoar-frost on a tree, a frozen lake in the Engadine, and a view at Ragaz strike us as particularly good. In fact, though the book is certainly not free from defects, it has not a few countervailing merits.

#### COLOUR AND PIGMENTS.

*Colour-sense Training and Colour Using.* By E. J. Taylor. Pp. 88. (London: Blackie and Son, Ltd., 1908.)

THIS should prove a very useful little book to teachers who wish to explain the fundamental laws of colour to their pupils. The old division of the spectrum into the three primaries—blue, yellow and red—still persists among artists and leads to much confusion of thought, and doubtless a book of this character will assist in bringing in a truer perception of the nature of colour-vision, while it is not so difficult as Prof. Church's book or Sir William Abney's "Colour Measurement and Mixture."

The author in dealing with this subject takes the ordinary Young-Helmholtz theory of the primary colour sensations, and is quite right in so doing. It is simpler, and at any rate covers most of the facts, and there is no need in a book of this character to discuss any rival theories which may exist. The weakest chapter in the book is that dealing with the mixing of pigments, and in a future edition this chapter might well be re-written and developed. One of the most important lessons the artist can learn from the study of the theory of colour is the extent to which he can limit his palette and get all the effects he requires. For instance, by means of a rich madder, cobalt yellow, viridian, and cobalt blue, every tint can be obtained, including a deep, rich, velvety black, while a complete spectrum can be constructed on a lower key by the use of black, Indian and Venetian red and yellow ochre, and it is therefore of great importance that the art student, having once mastered the theory, should test it by experiments with a few selected pigments, and should realise for himself that lampblack and yellow ochre really give a green, and that he can get practically a complete absorption of the spectrum from not more than three or four pigments.

It is also of importance that he should be trained to use a palette consisting of permanent pigments, and should avoid as far as possible those that are fugitive. It is therefore a pity to see in a modern text-book an artist advised to use such pigments as crimson lake, carmine, indigo and gamboge. These should all be excluded. The writer has also apparently not realised the extent to which his theory will assist the artist who wishes to paint in the method of the French impressionist school by the juxtaposition of small dots of colour instead of by an actual mixing of the pigments. If, for instance, blue and yellow are painted in small dots side by side, from a little distance the effect is to give a grey and not a green; in fact, green is the one colour which cannot be produced by such juxtaposition of pigment, but must

be obtained either by the use of a green pigment or the mixing of a blue and yellow so as to leave the net result of their mutual absorptions. A short discussion, therefore, of the French method of painting as opposed to the method of mixing pigments, and a statement of the actual results obtained by the blending in the eye of the lights reflected from two separate pure pigments painted side by side, would be of great value to the modern artist. Most of our painters to-day make use of both methods to get their effects, and would probably be much helped by being taught a few fundamental principles. The only reference which the author has to this method of painting is to be found on p. 60, where he says the designers avoid dirty tones by placing the pigments very close, with the alternate colours in dots and dashes, but he does not seem to realise that the resulting colour may be quite different from that obtained by blending the pigments.

There is another difficulty which faces the artist in dealing with actual pigments, and which has not been discussed by the author. Many when mixed with white completely alter in tint, and the matter is not so simple as it would appear from the description in the text of the graded tones to be obtained in this way. To take a simple instance, the great value of yellow ochre to an artist is that it can be mixed with white without an alteration in the tint, so that the yellow ochre let down with white has the same colour value to the eye. This is not true of most other yellows, and consequently yellow ochre is invaluable for producing the effect of bright sunlight falling on a white surface. With reference to the training of children in the meaning of colour, it is open to question if the modern kindergarten methods are wise. The colours which are used in practice for training young children, and from which they are supposed to build up various patterns, are remarkable for their peculiar ugliness and the hideous colour schemes which result from them. Children grow up with a beautiful perception of true colour schemes in many lands where the kindergarten methods have never been heard of, and one of our greatest difficulties at present is that those engaged in trade processes which involve the use of colour have no fine sense of what is beautiful. It is surely an open question whether the hideous colours presented to very young children in the kindergarten classes are not positively injurious, and tend to destroy any instinctive taste for colour with which they have been endowed by nature.

#### THE ATLAS OF CANADA.

*Atlas of Canada.* Prepared under the direction of J. White. Pp. 21; 83 plates. (Canada: Department of the Interior, 1906.)

THIS atlas, which has been compiled with great care, shows, in a form which can usually if not always be easily comprehended, much of the information which is at present obtainable concerning the Great Dominion. It contains about forty maps, and rather more than that number of plates of diagrams.